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Human Capital and Economic Growth – Challenges and Prospects for the Nigerian Economy

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ABSTRACT

Despite its recent policy reorientation towards capital accumulation as a means of boosting economic activity, Nigeria still faces low productivity, poor infrastructure, and underdeveloped human capital. In this paper, we review the challenges to Nigeria's development and explore the impact of human capital on economic growth over the period 2011 to 2017. To that purpose, Granger Causality Tests has been adopted to establish the causal dimension between human capital and economic growth. While we provide some tentative evidence on the contribution of human capital to economic growth, we also highlight key strategic questions that, when addressed, could provide some solutions to the existing pressing issues.

Key Words: Physical capital, Growth and development, Human capital, Granger Causality

1. INTRODUCTION

Traditional growth theories regarded capital accumulation as one of the key determinants of economic growth. However, the development however of the endogenous growth theory provided a different perspective according to which human capital plays an instrumental role in the growth process of economies around the globe. According to the Organisation for Economic Co-operation and Development (OECD), human capital is defined as '*the knowledge, skills, competencies and other attributes embodied in individuals or groups of individuals acquired during their life and used to produce goods, services or ideas in market circumstances.*'**.** An early proponent of the endogenous growth theory was Theodore Schultz's "Investment in Human Capital" (1961). According to Gary Becker (1964), human capital is determined by education, training, and medical treatment, and it is effectively a means of production. The inability of earlier growth theories to explain this paved way for modern theories that considered human capital to be endogenous to the growth process, generating increasing returns to scale. and compensating the decreasing returns of physical capital (Bassetti, 2000). Since human capital development is an economic process (Howitt, 2005), these theories help to understand the economic growth process depending on the stage of development of the nation in question.

Lucas (1988) introduced human capital as a key contributor to economic growth and viewed it as a cumulative variable of positive externalities. *Health and education are two closely related human capital components that work together to make the individual more productive and contribute to a nation's progress*. It is widely accepted that better health facilities are not only a consequence of economic growth in developed nations but have become a prerequisite for the holistic development of an economy. Likewise, education is an important enhancer of human capital fostering greater investments and stimulation for technological innovation (Sianesi and Reenen, 2003). Appleton and Teal (1998), describe health and education as components of human capital that are contributors to human welfare. Therefore, *health status acts as a key determinant of human capital and when linked to education, signals at the individual's health stock*. This can also depreciate like physical capital over time. But an individual can invest in one's health and overcome the depreciation. Therefore, it is discernible that a country's ability to innovate and remain productive depends on the characteristics and quality of its human capital.

As the global economy shifts towards a more knowledge-based sectors, human capital development becomes a central issue for policy makers and practitioners that engage in the process of economic development both at the national and regional level. In 1990, the United Nations Development Program (UNDP) transformed the landscape of development theory, measurement, and policy with the publication of its first annual Human Development Report (HDR) and the introduction of the Human Development Index (HDI). The HDR 1990 presented the concept of *"human development" as progress towards greater human well-being* and provided country-level data for a wide range of well-being indicators.[1] Key capabilities are instrumentalized in HDI by the inclusion of proxies for three important ends of development: access to health (measured by life expectancy), education (measured by adult literacy and enrolment at the primary, secondary and tertiary level), and goods (measured by purchasing power parity, PPP, and income).

The latest World Bank report released in early 2018, projects that Africa's economy will continue to rise to 3.2 percent in 2018 and 3.5 percent in 2019. As a country, Nigeria is immensely well endowed with both natural and human resources. It is an open economy, adopting policies to promote sustainable economic growth and break the cycle of poverty, low productivity, and stagnation. *Nigeria has been experiencing sluggish growth, high inflation, and political instability which have become bottlenecks to its economic progress and achievement of human development goals*. Nigeria's HDI for 2017 as per the UNDP database, is 0.532, which puts the country in the low human development category—positioning it at 157 out of 189 countries and territories. That is above the average of 0.504 for countries in the low human development group, but below the average of 0.537 for countries in Sub-Saharan Africa.

According to the United Nation's World Population Prospects 2017, Nigeria's population is equivalent to 2.57 percent of the total world population.[2] With 49 percent of the population still living in rural areas, *it is imperative that the country provides better access to health facilities and removes disparities* in the health system. Similarly, *access to primary and secondary education is vital to the empowerment of the citizenry,* enabling them to contribute towards the nation's productive growth and capacity development.

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[1] The HDI embodied Amartya Sen's "capabilities" approach to understanding human well-being, which emphasizes the importance of ends (like a decent standard of living) over means (like income per capita)

[2] 51 per cent of the population is urban (99,967,871 people in 2018) making Nigeria rank number 7 in the list of countries by population.

This papers purports to *a) evaluate the impact of human capital development on economic growth in Nigeria and b) understand the various dimensions of human capital and the structural challenges associated with them in Nigeria.*

Although there is a plethora of reports issued by governmental and international bodies on the state of Nigeria's economy this study sheds new light on the role of human capital to promote the Sustainable Development Goals (SDG) in the context of global competitiveness and improvements to the standards of living. The paper is organized as follows: section 2 reviews the literature and examines the components of economic growth, human capital, and the relationship between the two; section 3 outlines the current state of economic growth and human capital development in Nigeria; section 4 sets out the methodology and empirical investigation; finally, section 5 provides some concluding remarks.

LITERATURE REVIEW

2.1 Economic Growth

Growth theories originated from mercantilism and the basic crux of this ideology was that the accumulation of wealth will lead to the economic growth and development of a nation. In the second half of the 18th century, physiocrats replaced mercantilism propounding that agriculture and land development were important for economic growth. They emphasized productive work as the source of national wealth. The *classical economists paved the way for the theories to analyse the growth of nations*. Adam Smith argued that the wealth of an economy was based on trade and that wealth increases when two parties agree to exchange goods and services to obtain profit. Malthus (1798) opined that population growth can contribute to economic growth if there is an increase in effective demand. But since most of these theories were developed concurrent with the Great Depression, these were best suited for those economic situations. Keynesian growth theories and its different schools of thoughts have added to the understanding the growth process of nations**.** The premise of the Keynesian theory was that *effective demand will lead to a country's economic growth* (Hartwig, 2002). Economic activity was explained with reference to factors like national income, consumption, investment, and savings.

Important contributions were also made by the exogenous theories based on a competitive framework and on the assumption of a constant returns to scale and diminishing returns (Ucak, 2015). Exogenous growth assumes that *economic prosperity is primarily determined by factors that exist outside the given economy.* By contrast, internal factors are used in the Solow's Model which elucidates that population growth should be accompanied by investment growth. *Technological progress should not be a replacement of human capital and emphasis on the enhancement of skills, change in production system etc. are important for a nation to grow* (Conway et.al (2006). These theories have evolved to account for market imperfections. All these models were not useful for less developed states, as economic growth was not leading to development in most cases.

More recent *endogenous growth models focus on long-term growth*. They reflect the impact of imperfect competition and the changes in the rate of profit. The theories stress that technical and scientific progress is endogenous, stating that the quality of human capital is dependent on the investment in human development and intellectual property rights have been protected in an imperfect market. Governments were encouraged to create a favourable climate to attract investments and attract new technologies to develop science and technology. Romer (1989) stressed that *economic growth is directly dependent on the value of human capital.* Lucas's theory emphasizes that the *accumulation of human capital is an important economic process and can involve alternative costs*. The allocation of time between participating in current production or accumulating human capital will determine the rate of economic growth. Through these theoretical advances, human capital development has gradually become an important component of economic growth.

2.2 Human Capital

The earliest formal use of the term "human capital" in economics is probably by Irving Fisher in 1897. It was later adopted by various writers but did not become a serious part of the economists' lingua franca until the late 1950s.[3] According to Gary Becker (1964), *human capital is determined by education, training, medical treatment, and is effectively a means of production*. Robert Solow's pioneering working on economic growth led to the discovery of the "residue". It is that part of the economic growth that cannot be explained by the researcher. It was seen that physical capital accumulation could not explain the process of economic growth. Most of the growth was due to augmentation of labour through education, health, and improved health facilities. In order words, *an increase in*

[3] A Google "N Gram" of the term "human capital" reveals that there was virtually no usage in the English language until the late 1950s. After the 1950s the usage of the term increased until today, with a somewhat greater surge in the 1990s than previously.

human capital acted as an explanation for understanding the Solow's residue. In recent times, macroeconomic theories trying to explain the reasons for economic growth has been consensual that accumulation of both physical and human capital fosters rapid growth in a country. Among the neo-classical theories, the Sloan-Swan model is thought to be very significant. The model explained that *physical capital accumulation and technological advancements contribute to economic growth*. In the long-run, the model assumed that all the countries will converge to the same steady-state income level. However, the theory could not explain the widening gap between the rich and poor countries.

The inability of earlier growth theories to explain inequality paved way for modern theories that consider human capital development to be endogenous to the growth process, generating increasing returns to scale (Bassetti, 2006). The capacity of these theories to reconcile the economic process with the development of the country proves very helpful and since human capital development is an economic process (Howitt, 2005), *these theories help to understand the economic growth process depending on the stage of development of the nation*. Lucas (1988) introduced *human capital as a key contributor to economic growth and viewed it as a cumulative variable of positive externalities*. Mankiw, Romer, and Weil (1992) also argued that human capital can be viewed as an important factor of production. Human capital was viewed differently in various ideologies. In the neo-classical theories emphasis was on the stock of human capital whereas, in the endogenous framework, the emphasis was on the accumulation of human capital. However, there is no consensus on the ideal method of measurement for the impact of human capital on economic growth is. Also, there could be methodological issues like omitted variables, sample selection bias, and the availability of data. We believe that the inclusion of *human capital in growth accounting leads to enhancing the productivity and skills in the economy.*

2.3 Components of human capital

There could be several components to human capital accumulation and development including education, health improvements, research, training, learning by doing and capacity building. Schumpeter (1954) introduced the concept of 'innovation' to the field of economic sciences and considered entrepreneurs an integral part of economic development. The World Development Report (1997) enumerates how knowledge influences development in a country and how examining the difference in knowledge across and within the countries can avoid information failures and development challenges. Therefore, the ability to acquire, adapt, and adopt new knowledge will be an important determinant of economic growth. This perhaps must have heightened the need to investigate the link between education and economic growth (Isola, 2002).

Education

Psacharopoulos (1994) presents a consistent pattern of very large returns to primary education and somewhat smaller returns to secondary and post-secondary education. The World Economic Forum 2016 suggested three channels through which education affects a country's productivity. Firstly, *education increases the collective ability of the workforce* to carry out existing tasks more quickly. Secondly, secondary and tertiary education especially facilitate the *transfer of knowledge about new information, products, and technologies* created by others (Barro and Lee 2010). Finally, by increasing creativity, *it boosts a country's own capacity to create new knowledge, products, and technologies*. However, Caselli, Esquivel, and Lefort (1996) did not find robust evidence to support the view that investing in human capital necessarily produces growth. Likewise, improvement in the educational attainment of the labour force did not always have a positive impact on the rate of growth of output per worker (Pritchett, 1996).

A plausible explanation for that could be that the *quality of an education system evolves at a different pace across countries*. Hanushek and Kim (1995) show the *significance of labour force quality as an explanation of the international differences in per capita growth rates*. They conclude that there is strong evidence that the cognitive skills of the population are powerfully related to long-run economic growth. The relationship between skills and growth proves extremely robust in empirical applications. Therefore, ignoring the relationship between education and economic growth would endanger the prosperity of future generations, with widespread repercussions for poverty, social exclusion, and sustainability of social security systems.

Health

It is widely accepted that *better health facilities are not only a consequence of economic growth in developed nations but a prerequisite for the holistic development of an economy*. Improvement in health for the most part of the literature has occurred due to an increase in resources in a country. Investments in improved nutrition which also enhance the health of individuals. The health achievements that were most visible were an improvement in life expectancy by 30 years in most of the developed nations (Christensen et al., 2009). But the same did not happen for developing nations. These countries suffer from a high rate of aging and the incidence of chronic ailments which need to be analysed in conjunction with their economic performances. The fact that *human capital*

is seen beyond labour productivity in the light of health-related parameters is a recent occurrence that has gained importance in many social, economic and political debates.

In the early 1960s, economists like Schultz (1961) and Mushkin (1962) highlighted the importance of health in improving the overall productivity of human capital. According to Grossman's (1972) pioneering work, *health can be considered a capital good and hence health status acts as a key determinant of human capital and when linked to the education signals at the individual's wellbeing*. Later Preston's study (1975) highlighted a positive link between national income levels and life expectancy. Other studies revealed that the initial health conditions of a country prove to be a better indicator of subsequent growth than the initial level of education (Knowles and Owen, 1997). It is evident that such studies have also gained prevalence in developed nations, considering the issue of aging populations and the spread of chronic diseases. Various authors agree that the *role of healthcare was not restricted to the treatment of individuals, but also encompasses prevention of diseases through proactive strategies*. Bhargava et.al (2001) uses the adult survival rate as a proxy for health status and found an important link between economic growth and health in developing nations. An improvement in health factors can have a positive *impact on productive efficiency, learning capacity* (Miguel, 2005), *creativity* (McCain and Mustard, 1999) *and reduction of inequality*. A reduction in income inequality will allow households to participate more proactively in economic growth (Howitt, 2005) and a decline in health inequality (Deaton, 2003).

2.3 Link between human capital and economic growth

In trying to understand the association between human capital and economic growth, Pritchett and Summers (1996) argue that over a half a million child deaths in the developing world in 1990 alone can be attributed to the poor economic performance in the 1980s. Bloom and Canning (2000) suggest that *health is an important component of human capital and emphasised on the notion of health-led growth.* Better health leads to higher income, but there is also a positive feedback effect, giving rise to a beneficial situation where health and income improvements are mutually reinforcing. Hall and Jones (2007) suggest that *rising health expenditure as a part of human capital development occurs as consumption continues to rise, which is indicative of changing economic conditions*. The development of new and expensive medical technologies is surely part of the process of rising health spending.

The relationship between health and education has been established in many studies (see for instance, Cutler and Lleras-Muney, 2006; Silles, 2009) usually exploring three channels - *productive efficiency, allocation efficiency, and time preference.*[4] Ricci and Zachariades (2009) elucidate that education exerts positive external effects on health, beyond the standard internal effects documented. As per Soukiazis's (2008) study, there may be a causal relationship between income (a proxy of economic growth), and human capital with *possible feedback and spill-over effects*. Health improvements can lead to higher human capital and therefore higher economic growth. On the other hand, better education leads to improvement of health at both individual and aggregate level. Likewise, *when a nation progresses with desirable economic performances, it has better resources for research and development in the healthcare and education sectors*. Again, the causal relationships among the factors might vary depending on demographic and socio-economic situations. Morbidity reduction translates into an increased supply of labour (Garthwaite,2012) predominantly in the developing countries and boosts better savings rate (Bloom, Canning, and Graham, 2003). Many authors also highlight that *health investments made on women and children yield greater results than those made on men and the elderly* (Miguel and Kremer, 2004; Baldanzi et al., 2017).

But what is to be kept in mind is that these *causal relationships might not be uniform across all countries*. Especially the developing nations do not experience such patterns most of the time due to the prevalence of factors like chronic diseases, poverty, inequality etc. Cervellati and Sunde (2011, 2015a) show that longevity improvements stimulates educational investments and economic growth only if a country has already undergone the demographic transition.[5] Another issue for most of the developing nations is the *role of infectious diseases that affect the quality of human capital and economic growth*. They lead to high rates of mortality and high

[4] The first approach states that educated people are more effective in using healthcare service. According to the second approach, educated people are more aware of the negative effects of ill-health and thus devote more time and resources in healthcare. And according to the last hypothesis, improvements in an individual's outlook, make people more likely to invest in protecting that future.

[5] They conclude that greater longevity will have an insignificant effect on per capita income in the pre-transition phase of a nation. But the effect will be stronger in the post-transition phase for a nation when associated with higher education facilities. Thus, health improvements may be detrimental to economic growth in pre-demographic transition societies and beneficial in post-demographic transition societies until very high levels of longevity are reached, at which point the effect becomes negative once again.

volatility of health and survival. In such a situation, only income growth is not enough to help the country propel to the next level of development. An economic transition without major epidemic shocks will help in building protective human capital (Lagerlof, 2003). Given the array of literature available on the relationship between human capital and economic growth, it will be interesting and enlightening to investigate this association in the current Nigerian context. To this end we will be exploring the following research questions:

- ***Does human capital development have an impact on economic growth in Nigeria?***
- ***What is the causal dimension between human capital and economic growth in Nigeria?***

2. ECONOMIC GROWTH AND HUMAN CAPITAL DEVELOPEMENT IN NIGERIA

3.1 Economic Growth

Over the years, despite the considerable degree of trade openness, Nigeria's performance in terms of *economic growth has remained sluggish and discouraging* (Adekunle and Moses, 2018; Odedekun,1997). In recent years, growth has been decreasing. The per capita real gross domestic product (GDP) has remained stagnant from 2011 to 2017 not providing the impetus for robust growth of the Nigerian economy (see Table 1 in Appendix). When we observe the figures *for trade as a percentage of GDP*, we note a smooth but downward trend in the trade statistics. The *inflation rates in Nigeria have suffered from extreme fluctuations,* rising as high as 16.52 in 2017. This volatility exerts a huge pressure on the Nigerian population causing a *steep rise in the cost of goods and deepening poverty*. The main causes of inflation in Nigeria are attributed to its long history of civil wars and insurgency. Corruption is one of the chief causes of rising prices and may take the form of bribery, fraud, political corruption, extortion, and bureaucratic corruption (World Bank Report, 1997).

The Nigerian economic environment *has been unable to attract foreign direct investment (FDI)* to its fullest potentials. It was suggested that there is no long-run relationship between FDI and economic growth in Nigeria (Olatunji et. al, 2015). The FDI is not channelled towards productive use, rather it is used to supplement consumption, substitute for saving and devoted to the importation of consumer goods and services at the expense of investments and exports (Adelegan, 2000). Prior to Nigeria's political independence in 1960, agriculture was the mainstay of the economy assuring livelihood of majority of the population. According to the United Nations agriculture has contributed to less than 1 per cent to the Nigerian economy. *Agricultural production increases have not kept pace with population growth, resulting in rising food imports and declining levels of national food self-sufficiency* (FMARD Report, 2008).

The manufacturing sector has been benefitted from various reforms such as the introduction of low-interest credit, prohibitions on foreign goods etc, and the ease of doing business has moved to the 145th place in 2017 from 169th in 2016, for instance. The *services sector has shown impressive gains* amid tough economic circumstances. Its contribution to GDP has been consistently rising since 2011 reaching a high in 2016. The boom in the service sector has helped the Nigerian economy to recover from its slow-paced agricultural performance and to induce technology in different settings.

The advent of the *Micro, Medium and Small Enterprise (MSME) sector in Nigeria is a major catalyst for its overall growth and development*. For a sustainable economy, MSMEs have been stressed as capable of helping in bringing about the positive economic turnaround and of complementing the effort of the existing industries (Osuagwu,2001; Rasak, 2012). In Nigeria, this sector has long been neglected long due to the undue importance of large-scale industries. The government and financial institutions need to support the MSME sector by providing better access to credit, creating an enabling environment of infrastructural development, and promoting MSME goods and services.

Nigeria was ranked 115th in the *Global Competitive Index* [6] (out of 140 countries) in 2018. In 2017, it ranked 112nd (out of 135 countries in the sample) with an overall score of 47.6 out of a total score of 100. After benefitting from a period of fast growth, driven by strong foreign demand and high commodity prices, the Nigerian economy

[6] The index sheds light on emerging sets of drivers of productivity and long-term growth. This index is comprised of four broad areas of enabling environment, markets, human capital and innovation system. Each area is again formed of several pillars to provide a holistic elucidation.

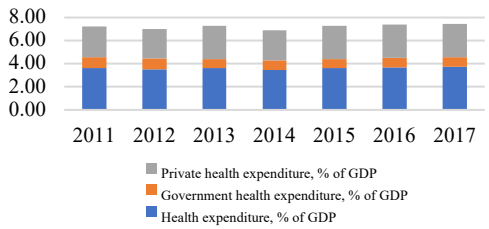
needs to strengthen its foundation to become more resilient to commodity price shocks and to compete successfully in the technology-driven global economy.

3.2 Human Capital Development in Nigeria

Healthcare

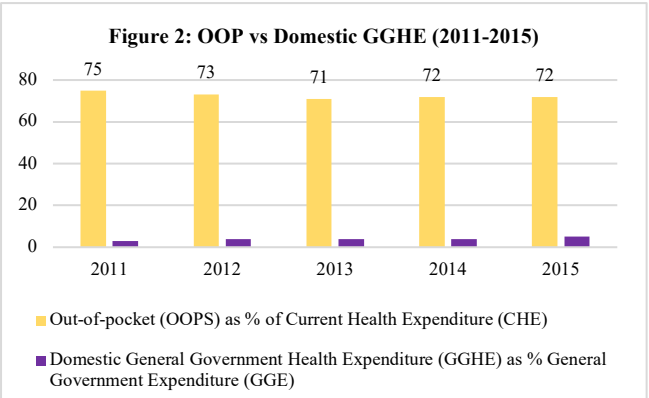
The health system in Nigeria is of particular importance, since it has one of the largest populations in the African subcontinent. As per the Economist Intelligence Unit country report of 2018, Nigeria has a population of 195.9 million, and it is predicted to grow in the future. Therefore, *it is crucial that the vast population has access to basic healthcare that is affordable and need-driven.* The total sum allocated to health in the 2018 budget is N340.456bn out of a total national budget of N8.612tn. This sum represents only 3.95 percent of the total budget. When compared to the 2017 health budget, which was an aggregate sum of N308.464bn, the rate was 4.15 percent of the federal budget. This is still very low and less than one-third of the Abuja Declaration benchmark (MNCH Budget Policy Brief, 2018). The *Nigerian healthcare expenditure as a percentage of GDP has been stagnant at around 3.7 percent until 2017* (see Figure 1). Of the total health expenditure, the proportion of Government spending has been very low when compared to private spending.

Figure 1: Trend of Health Expenditure as a % of GDP (2011-2017)



A closer look at the *key health indicators for Nigeria reveals the weakness of health system when compared to the international requirements of the World Health Organisation (WHO)* (see Table 2 in the Appendix). Nigeria's high rates of maternal, child and infant mortality present an enormous challenge to policymakers and stakeholders at all levels of Nigerian society. The national health system in Nigeria is decentralised into three tiers with responsibilities at the federal, state and local Government level. Nigeria operates a pluralistic healthcare system with the orthodox and traditional health practitioners operating without any collaboration, and the latter particularly without any regulation (Omoluabi, 2014). According to a report published in 2017 by the Global Burden of Disease Health Financing Network, *out-of-pocket spending (OOP) in Nigeria is about 70 percent of the total health expenditure* (see Figure 2). The report identifies that out-of-pocket spending at the point of service delivery is undesirable because it causes financial distress, especially for the poor as it can tip households into poverty or deepen existing poverty.

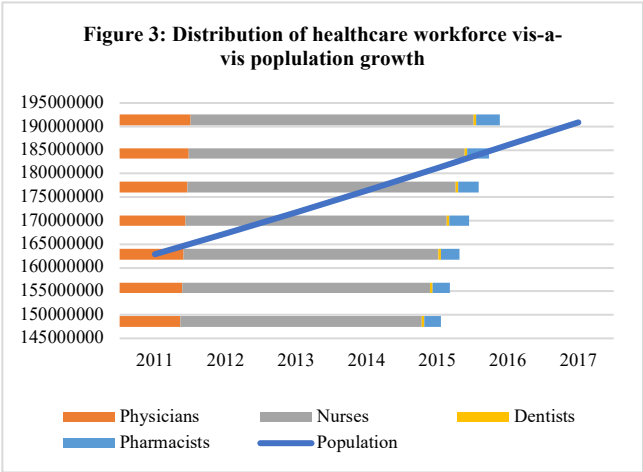
Figure 2: OOP vs Domestic GGHE (2011-2015)



The issue of *lack of adequate human resources for the healthcare sectors* has been increasing in Nigeria as the nation transitions from traditional medicine to bio-medical alternatives (WHO, 2000).[7] An understaffed health system will result in poor service delivery and, inefficient management, and it will undermine the health systems objectives of efficiency and universal coverage (see Figure 3) Persistently *low and inequitable distribution of health workers remains a major challenge* in the national health sector (Abimbola et. al., 2016).[8]

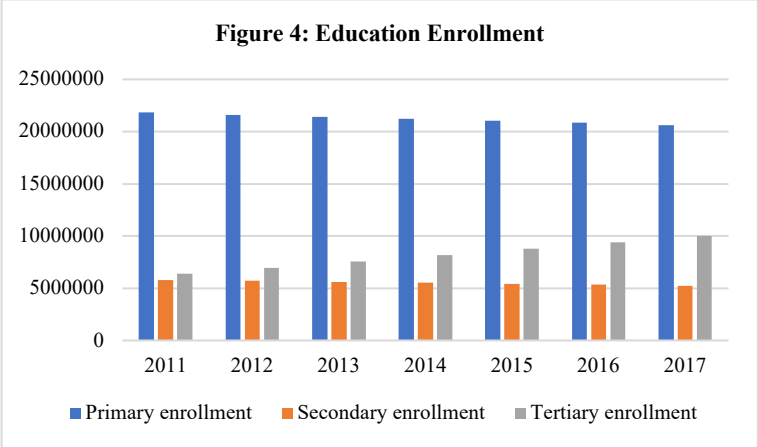
[7] WHO (2000), World Health Organisation Medicines Strategy: Framework for action in essential drugs and medicines policy 2000–2003

[8] Abimbola S. et. al. (2016), "Where there is no policy: governing the posting and transfer of primary health care workers in Nigeria", International Journal of Health Planning and Management, 2016

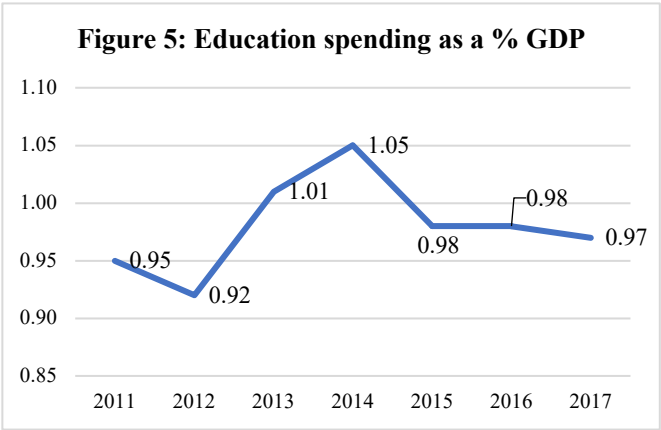


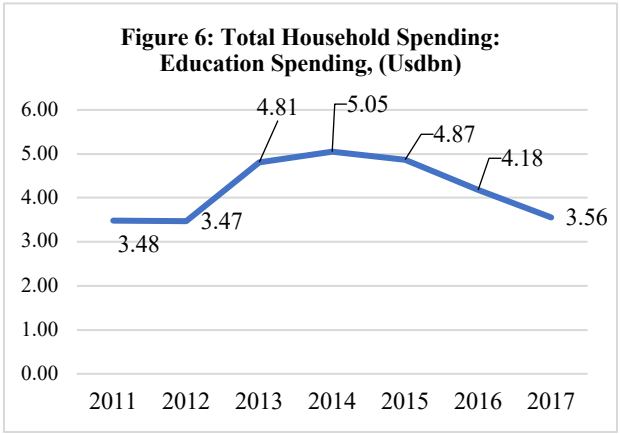
This shortfall creates life-threatening situations especially in rural areas and it has been further complicated by *gross inequity in health workforce distribution,* as there is no national policy guiding the postings and transfers of health workers. While investigating the *healthcare infrastructure*, it is seen that there is rising demand for quality medical care which is evident from many outbound medical tourists from the country (Healthcare Infrastructure in Nigeria Report, 2017). The *number of public hospitals has been very static* which has resulted in the mushrooming of private hospitals. The hospital bed density was at 0.95 per 1000 population. This is very low when compared to other African countries like South Africa. The existing structures suffer from *obsolete equipment and lack of requisite infrastructure to expand/deepen medical specialisation*. This has significantly limited the ability of healthcare institutions, the public sector hospitals, to align their services to the changing disease trends.

Education



An important component of human capital is education and a skilled workforce is needed to make effective use of the resources to lead to economic growth. A*ccess to education in Nigeria is not enough to cater for the growing population* (see Figure 4). Another major roadblock in Nigeria's human capital development is the *low educational initiative from the Government.* The educational expenditure as a per centage of GDP is very low and has not shown any significant progress over the years (see Figure 5). This is also behind the lack of creation of opportunities for human capital to grow and explore various areas. Likewise, the share of *household spending in education and training is very small* when compared to other living expenses (see Figure 6). It is as low as 2.59 percent of the total consumption expenditure in 2017, according to BMI research database. However, one positive aspect has been the rising household education expenditure which is indicative of an improvement in awareness and access to education. *This sector of the nation is also affected by the issue of brain drain*. Its escalation reached an alarming rate in Nigeria in the 1980s, when militancy dictators were in power (UNDP 2001: & The World Worst Dictators 2010). Higher incidence of poverty and poor nutrition has also contributed to making manpower assets vulnerable to the brain drain in the country. Again, poor salaries and benefits have also added to the problem (Oni, 2010).





4. EMPIRICAL INVESTIGATION AND RESULTS

The empirical investigation covers the period of 2000 to 2017, and we follow the previous studies in literature (Mayer,2001; Narayan and Russel,2004; Meulemeester and Denis, 1995) to determine the causal dimension between economic growth and human capital. The health expenditure (expressed in US dollar billions) and education expenditure (expressed in US dollar billions) were selected to measure human development and the real GDP (at constant 2010 prices) measures economic growth. The secondary data are sourced from the World Bank Indicators.

Firstly, the data was checked for the existence of unit root by the augmented Dickey-Fuller (ADF) test (at first difference). The lag length was selected by Akaike Information Criteria. The ADF results (see Table 3 in Appendix) highlight that when the test statistic and the critical value at a 5 percent is compared (-3.7611), we can reject the null hypothesis that the series has a unit root. Therefore, we can append that the time series has no unit root and the data is stationary.

The results of the Granger Causality Test confirm the presence of two significant causal relationships at a 5 percent level of significance (see Table 4 in Appendix).

Firstly, ***the causality between health and real GDP is unidirectional and the direction of causality is from health expenditure to real GDP.*** This tells us that an increase in the health expenditure for the nation will increase the momentum of economic growth. Investing in health will ensure better accessibility to it, which will contribute to the development of human capital and national growth.

Secondly, ***the causality between real GDP and education is unidirectional and the direction of causality is from real GDP to education expenditure.*** This shows that with an increase in the real GDP, the incentives for education increases; the nation is better equipped to improve the educational infrastructure and channel these resources to overcome various challenges.

The Granger Causality tests do not show any bidirectional relationship among the variables. Although there is some independent relationship between the variables, they cannot be considered due to statistical insignificance.

Therefore, in reference to our first research question, we have been able to find statistical evidence that health as a component of human capital has a significant impact on the economic growth of Nigeria. With the provision of appropriate health care, the population could enjoy better health, and thus the nation's human capital would be stronger and better able to contribute to economic growth through improved productivity. In reference to our second research question, the paper has been able to prove unidirectional causality from health to economic growth and from economic growth to education respectively. As identified, improved healthcare expenditure will make a more productive nation possible, whereas robust economic growth will enhance primary and secondary education, empowering the citizenry with more skills, experience, and opportunities.

5. CONCLUSION

This study has investigated the relationship between human capital and economic growth in Nigeria. It helps in evaluating and appraising the positive impact of human capital development on economic growth in Nigeria. The

study enables us to understand the various dimensions of human capital and the structural challenges associated with these in Nigeria. It also highlights key questions which when answered can help Nigeria overcome the constraints to growth and improve economic and human development outcomes. The per capita real gross domestic product (GDP) has remained stagnant while experiencing extreme fluctuations in its inflation. Nigeria has been unable to attract foreign direct investment which has not provided any boost to its economic growth. The growth in agriculture has not kept pace with the population growth and national food security is a critical issue. However, the manufacturing sector has benefitted from various reforms like the introduction of low interest credit, prohibitions on foreign goods, etc. and the service sector has also shown impressive gains.

As per the Economist Intelligence Unit country report of 2018, Nigeria has a population of 195.9 million which is predicted to grow in the future. Therefore, it is crucial that the vast population has access to basic healthcare that is affordable and need-driven. The Nigerian healthcare expenditure as per cent of GDP has been stagnant at around 3.7 percent till 2017. A closer look at the key health indicators for Nigeria reveals the weak health system prevalent in the country when compared to the international requirements of the World Health Organisation. Again, according to a report published in 2017 by the Global Burden of Disease Health Financing Network, out-of-pocket spending (OOP) in Nigeria is about 70 per cent of the total health expenditure. The issue of lack of adequate human resources for the healthcare sectors has been increasing in Nigeria and persistently low and inequitable distribution of health workers remain a major challenge. Nigeria also suffers from inadequate healthcare infrastructure which has significantly limited the ability of healthcare institutions, namely the public sector hospitals, to align their services to the changing disease trends. Similarly, access to education in Nigeria is not enough to cater to the growing population. The low educational initiative by the Government and the low household spending on education and training emphasis the lessened support and initiative for formal education in the nation. This sector is also affected by the issue of brain drain. However, one positive aspect has been the rising household education expenditure which is indicative of an improvement in awareness and access to education.

Our empirical investigations found a unidirectional causality from health expenditure to real GDP, and from real GDP to education expenditure respectively. With the provision of appropriate health care, the population could have better health, and thus the nation's human capital would be stronger and better able to contribute to economic growth through improved productivity. A robust economic growth will enhance primary and secondary education empowering the citizenry with more skills, experiences, and opportunities. Our study is limited to only 18 years of investigation and three key variables. Future scope of study will include other factors to represent economic growth and human capital development.

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APPENDIX

Table 1: Economic parameters of Nigeria

Year	2011	2012	2013	2014	2015	2016	2017
Real GDP per capita (constant 2010 US$ billion)	2376.639	2412.861	2475.948	2563.092	2562.522	2455.919	2412.41
Household real consumption expenditure (annual % growth)	-3.05	0.006	21.06	0.614	1.453	-5.7	-0.1
Government final consumption expenditure (annual % growth)	4.5	-1.98	-10.2	-7.01	-11.89	-15.11	-8
Trade (% of GDP)	41.77	35.94	30.75	27.12	20.66	18.29	24.45
Merchandise exports (current US$)	116	114	102	94	51	35	46
Merchandise imports (current US$)	56	51	56	60	48	39	45
Inflation	10.83	12.22	8.5	7.98	9.09	15.65	16.52

Source: World Bank Data

Table 2: Health estimates of Nigeria vis-à-vis African region estimates

Parameters	Nigeria estimates	African region estimates
Adult Mortality (2016)	Male-372, Female-333, Both-352	Male-306, Female-248, Both-277
Infant mortality as measured by the number of infants' deaths (2017)	466 per 1000 live births	1844 per 1000 live births
Healthy Life Expectancy at birth (2016)	Male-48.7, Female-49.2, Both-48.9	Male-52.1, Female-54.9 Both-53.8
Life expectancy (2016)	Male-54.7, Female-48.6, Both-55.2	Male-59.6, Female-62.7, Both-61.2
Maternal Mortality ratio (2015)	814 per 1000 000 live births	542 per 1000 000 live births
Adolescent birth rate (per 1000 women aged 15-19 years)	145 (2014)	99.1(2018)
Antenatal care coverage (%) (2017)	26.3	52.2
Births attended by skilled health personnel (%) (2013-2017)	43	
HIV prevalence among adults aged 15-49 years (%) (2017)	2.8	4.1
Incidence of tuberculosis (per 100 000 population) (2017)	219	237

Source: Global Health Observatory, World Health Organisation

Table 3: ADF Test Results*

Time series Data	ADF Test Statistic
Real GDP	-4.250691
Health expenditure	-6.083351
Education expenditure	-5.614524
*Critical value at 5 per cent level of significance	

Source: Author's calculations

Table 4: Granger Causality Test

Parameters	GDP	HEALTH	EDUCATION
GDP	--	0.35760 (0.55939)	--
HEALTH	6.91577 **(0.01979)**	--	0.90021 (0.35882)
GDP	--	--	5.38934 **(0.03586)**
EDUCATION	0.29862 (0.59335)	0.23599 (0.63463)	

Source: Author's calculation (Figures in parentheses denote probability values)